

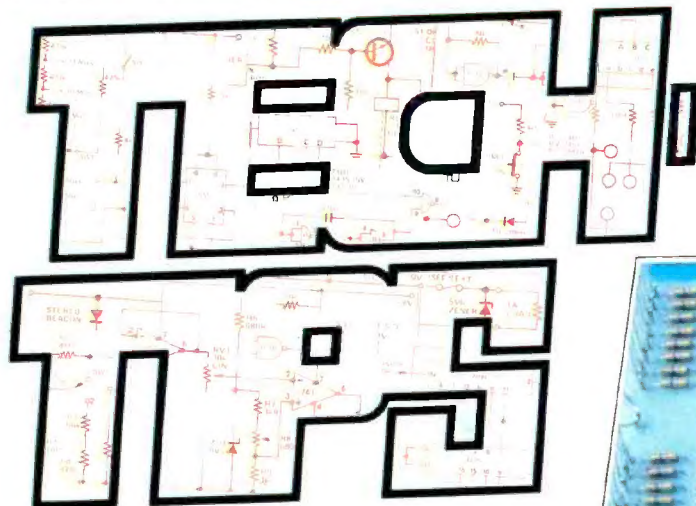
electronics today

NOVEMBER 1979

INTERNATIONAL

50p

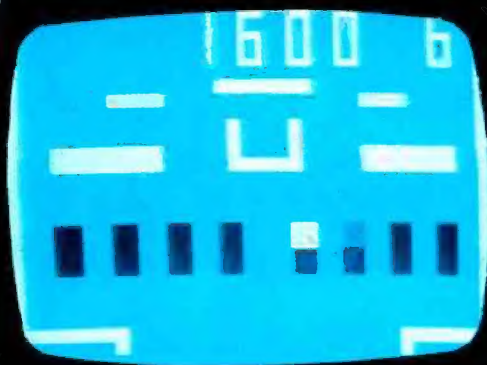
8 PAGE
SPECIAL



**2 Wire
Model Train
Controller**



**Pinball
TV Game**



ETI DOES IT AGAIN!

**SEIKO 45%
OFF**

CALCULATOR WATCH

... NEWS ... PROJECTS ... MICROPROCESSORS ... AUDIO ...

PINBALL TV GAME

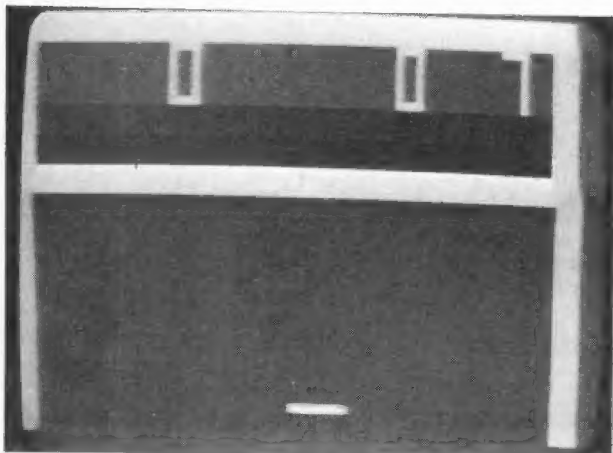
A dedicated chip TV game may seem strange in these days of the programmable? It won't when you consider the unique games and the fact that this EXCLUSIVE ETI PROJECT will only ever be built by 500 people.

THIS TV GAME is a 'dedicated chip' version of a game which has been available on cartridge models for some time — breakout. In addition to this, however, there are four pinball games and two solo 'basketball' type of game which are rare — if not unique. The breakout is highly addictive we warn you — it has amazing potential for stopping all life beyond the paddle control. And as only 500 of the chips are available, the Jones's will have some trouble keeping up! The pinball games are available in both flipper and paddle options — and also a small bat option for inflicting greater frustration upon oneself.

Breakout!

Undoubtedly our favourite game was the breakout. It comes in four options, of which the simplest is the most fun. Each hit knocks a brick out of the wall, until a gap right through is produced, and then the ball can

Breakout untouched



demolish the wall from the back, but note that the bat goes down to half size as soon as the ball hits the rear wall and the ball speeds up on contact with the back three rows of bricks.

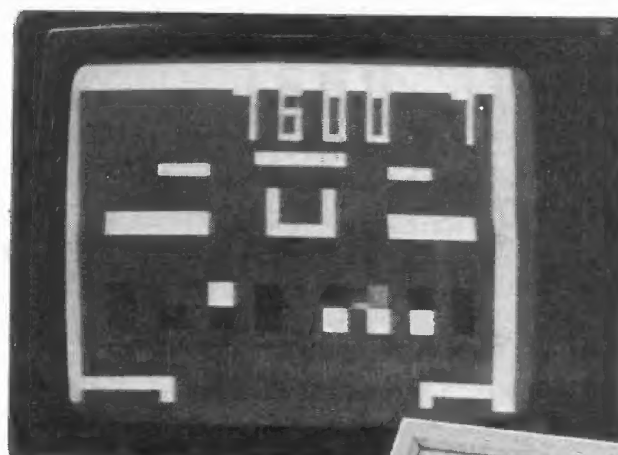
In addition the angle at which the ball deflects from the bat alters radically on the eighth 'hit' — just to keep things interesting. You have seven balls to remove two sets of walls, appearing consecutively, from the screen.

Two other versions provide small bat and only five balls with which to work.

Other Attractions

Rather than iterate every last little detail, we've used screen display photos to show the games and options available around those games. Pinball with a paddle is entertaining — to put it mildly!

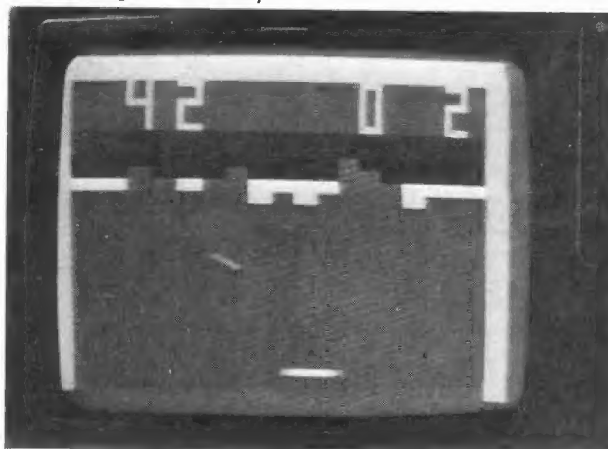
Solo basketball requires that you keep the ball bouncing on the bat,

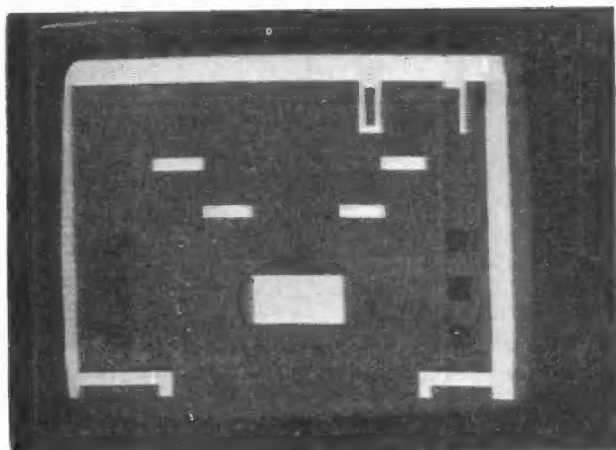


Pinball one underway!

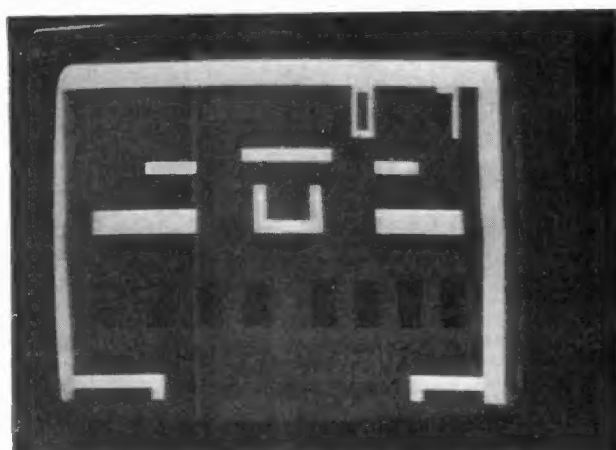


Breakout begun — and badly!





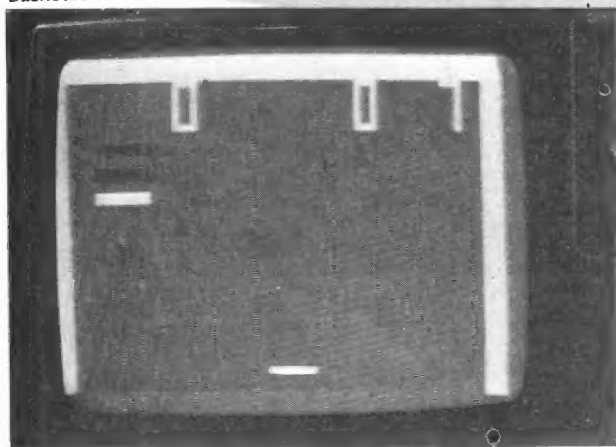
Pinball Two — four options



Pinball One — four options



Basketball



and then press the enter flipper button to "fire the ball upward to the targets. The longer the ball has been bounced on the bat, the more energy it possesses on firing.

No PSU is shown here, beyond a suggested circuit, because these 9V battery eliminators are available commercially at prices that probably make them cheaper to buy than build. If you must go it alone then this is not critical. All that is required is 9V at about 1.0mA or thereabouts.

Construction

There is no setting up to be done, apart from tuning your TV to channel 36. All the components mount onto the PCB, including the modulators, so building up the game should pose no problems at all. Use sockets for the ICs as the 'capital cost' is low compared to that for a new set of chips!

Mount up all the 'passives' first, then the modulators and Xtal. Test your 5V line before plugging in the ICs if possible. If all is well fit a UHF lead and plug into the aerial socket of the TV set. The signal should appear somewhere around channel 36, at which point the white noise will vanish and the first pinball game appear on the screen. The brightness and contrast may need adjusting to get the best display — use the breakout game for this. All three tones of brick should be clearly distinguished from one another.

Pressing game select should step the display through the range of games available, with Reset getting things under way

HOW IT WORKS

As with all LSI based games, there is little outside the games chip package of which to speak. All the video sound and sync signals are generated within IC1. The 2112 RAM is provided to hold the 'game selected' signal and score. This is refreshed by IC1 whenever an increment is added by play. At the end of each game (in breakout and basketball) the final score is loaded for display on the screen during the next game. The pinball game scores would require too much screen space, and too many bits,

to store.

Q1 and associated circuitry regulate the 9V input from the external PSU to a stable 5V to drive the units' own circuitry. The clock frequency is set by XTAL1, C9, C11, and R14 forming a standard Xtal oscillator. IC3 is a 4019 Quad and/or multiplexer to interface SW1-SW6 with the select lines of IC1.

Paddle control RV1 is 'padded' by the 27k resistor to prevent a 'zero resistance' condition between the 5V line and IC1.

BUYLINES

NIC Models supply all the components for this project.

A complete kit is available for £28.95 all inclusive. Individual components may be purchased as follows:

PCB and Game Chip:

£19.90 all inc.

Modulators:

£5.80 pair

Xtal

£3.00 all inc.

The PCB is copyright NIC models and may not be obtained elsewhere. See ad elsewhere in this issue for ordering details. Likewise the chips (all 500 of them!) are initially single sourced.

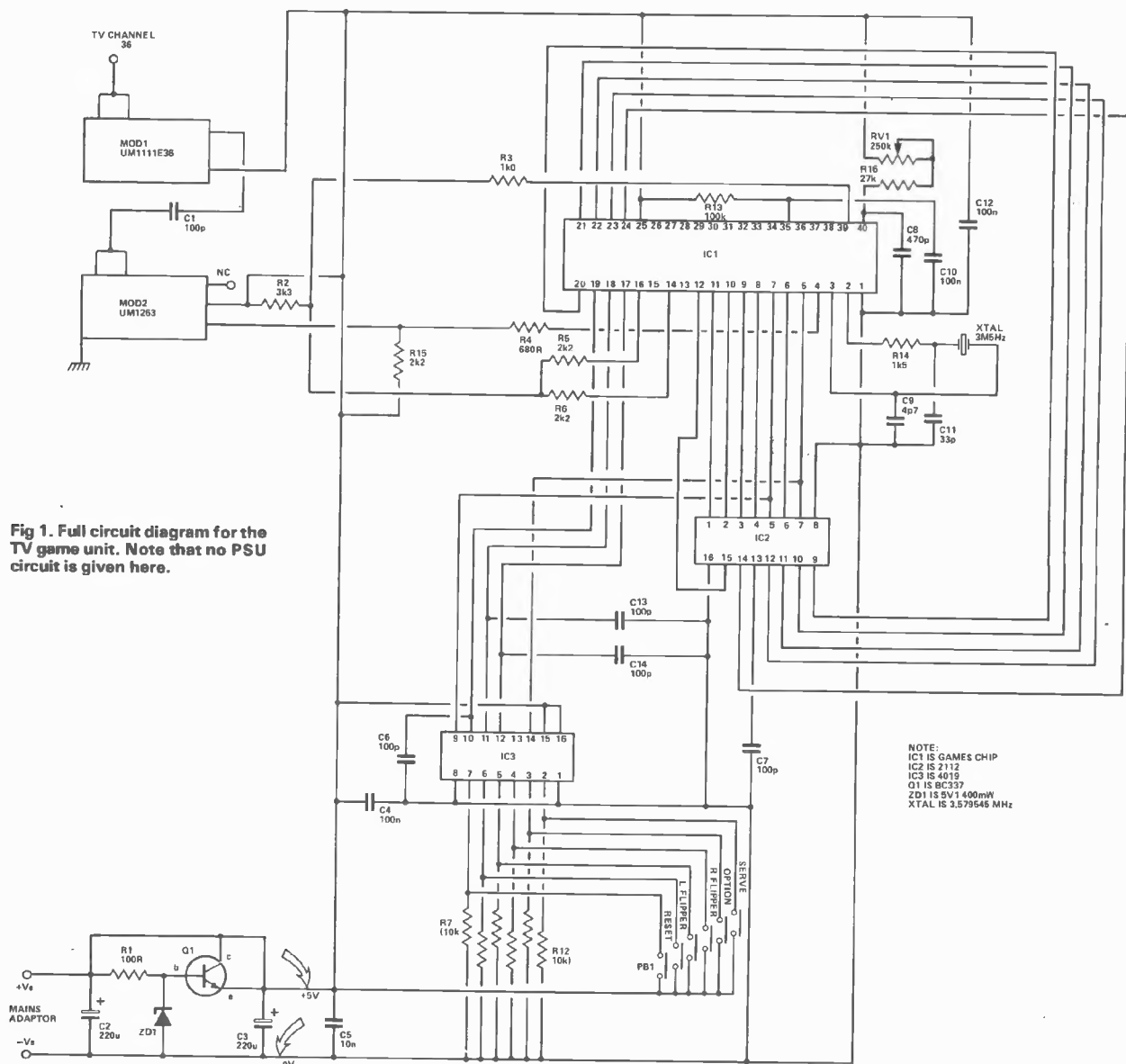
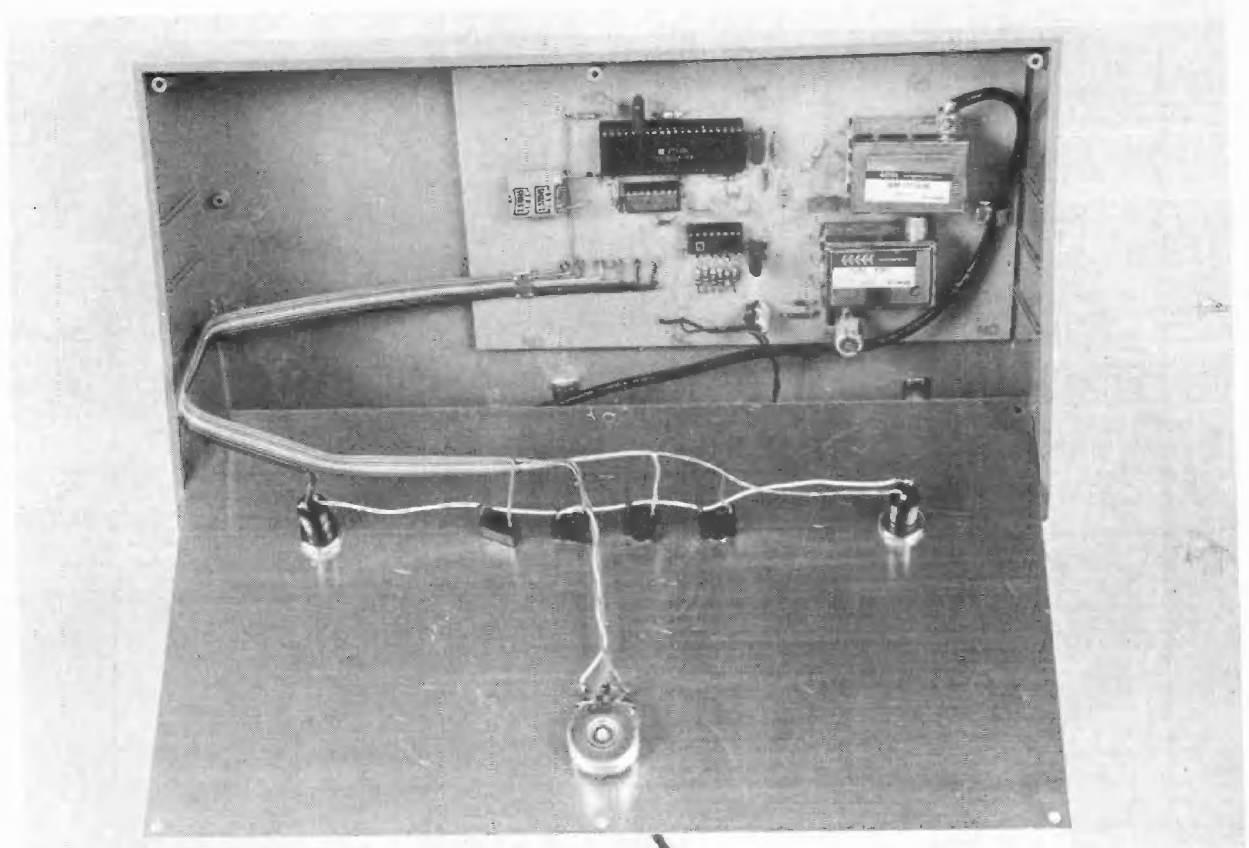


Fig 1. Full circuit diagram for the TV game unit. Note that no PSU circuit is given here.

NOTE:
IC1 IS GAMES CHIP
IC2 IS 2112
IC3 IS 4019
Q1 IS BC337
ZD1 IS SV1 400mW
XTAL IS 3.579545 MHz



Internal view of the unit, showing the space left to mount a PSU board should you desire to power it this way.

PARTS LIST

RESISTORS		all 1/2W 5%
R1	100R	
R2	3k3	
R3	1k0	
R4	680R	
R5, 6, 15	2k2	
R7-12	10k	
R13	100k	
R14	1k5	
R16	27k	
CAPACITORS		
C1, 6, 7, 13, 14	100p polystyrene	
C2, 3	220u 16V electrolytic	
C4, 10, 12	100n polyester	
C5	10n polyester	
C8	470p polystyrene	
Ca	4p7 ceramic	
Cu	33p ceramic	
SEMICONDUCTORS		
IC1	See text	
IC2	2112	
IC3	4019	
Q1	BC 337	
ZD1	5V1 400mW	
MISCELLANEOUS		
XTAL (3.57 MHz)	Modulators	
RV1 (250k linear)	Box to suit	
PCB		

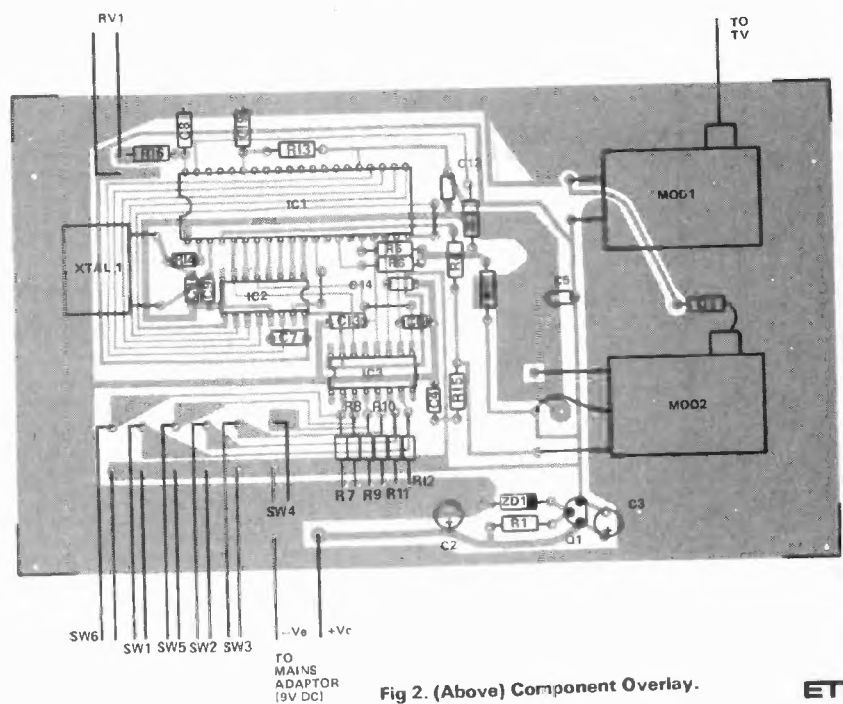


Fig 2. (Above) Component Overlay.

ETI

Great new Crofton double!

Self contained MONITOR PCB



- Compact size, 5" x 7"
- Complete with power and video plugs, plus leads
- Scan coil assembly as standard supplied
- Transformers, tubes, and surrounds available
- 15v Mains or 12v DC power
- Ideal for O.E.M. use

self contained 10" MONITOR



- Totally enclosed
- All transisterised
- Suitable for analogue signals or alphanumerics
- Operable on 220v Mains or 12v DC power
- Comparable to wire frame monitors

ONLY £35.50 ONLY £95.00

EX VAT AND P&P

Crofton Electronics

Crofton Electronics Limited, 35 Grosvenor Road,
Twickenham, Middlesex. Tel.: 01 891 1923

The latest from the U.S.A.

Pinball Wizard

Featured in this issue as a project

Basic Kit
£28.90 Inc

Contains every-
thing except
case and controls

Mains adaptor
£3.90

Home
TV Game
Brought
to you
as a b/w
KIT

Play at home
on your own TV

Sound from TV

Play 7 games with 4
options on each game

4-Pinball games
2-Basket games
1-Breakout game

Limited edition
Order now, save
disappointment

See last issue of E.T.I. for current offers of goods.

NEW Versatile car alarm kit. Can be used for car, caravan, boat, etc. See review in Hobby Electronics. Build it yourself for only **£18.90** very complete kit.



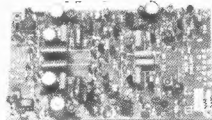
N.I.C.
27 Sidney Road, London N22 4LT
01-889 9736

S.A.E.
with all
enquiries
please

TOTAL AMPLIFICATION FROM CRIMSON ELEKTRIK

WE NOW OFFER THE WIDEST RANGE OF SOUND PRODUCTS

STEREO PRE-AMPLIFIER



CPR 1 — THE ADVANCED PRE-AMPLIFIER. The best pre-amplifier in the U.K. The superiority of the CPR 1 is probably the disc stage. The overload margin is a superb 40dB, this together with the high slewing rate ensures clean top, even with high output cartridges tracking heavily modulated records. Common-mode distortion is eliminated by an unusual design. R.I.A.A. is accurate to 1dB; signal to noise ratio is 70dB relative to 3.5mV, distortion <.005% at 30dB overload 20kHz.

Following this stage is the flat gain/balance stage to bring tape, tuner, etc. up to power amp signal levels. Signal to noise ratio 86dB, slew-rate 3V/uS. T.H.D. 20Hz—20kHz <.008% at any level.

F.E.T. muting. No controls are fitted. There is no provision for tone controls. CPR 1 size is 138x80x20mm. Supply to be ± 15 volts.

MC 1 — PRE-AMPLIFIER. Suitable for nearly all moving-coil cartridges. Sensitivity 70/170uV switchable on the p.c.b. This module brings signals from the now popular low output moving-coil cartridges up to 3.5mV (typical signal required by most pre-amp disc inputs). Can be powered from a 9V battery or from our REG 1 regulator board.

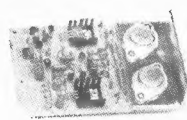
XO2-XO3 — ACTIVE CROSSOVERS. XO2 — two way, XO3 — three way. Slope 24dB/octave. Crossover points set to order within 10%.

REG 1 — POWER SUPPLY. The regulator module, REG 1 provides 15.0-15v to power the CPR 1 and MC 1. It can be used with any of our power amp supplies or our small transformer TR 6. The power amp kit will accommodate it.

POWER AMPLIFIERS. It would be pointless to list in so small a space the number of recording studios, educational and government establishments, etc., who have been using CRIMSON amps satisfactorily for quite some time. We have a reputation for the highest quality at the lowest prices. The power amp is available in five types, they all have the same specification. T.H.D. typically 0.1% any power 1kHz 8 ohms T.I.D. insignificant; slew rate limit 25V/uS, signal to noise ratio 110dB, frequency response 10Hz-35kHz — 3dB stability unconditional, protection drives any load safely, sensitivity 775mV (250mV or 100mV on request), size 120x80x25mm.

POWER SUPPLIES. We produce suitable power supplies which use our superb TOROIDAL transformers only 50mm high with a 120-240 primary and single bolt fixing (includes capacitors/bridge rectifier).

POWER AMPLIFIER



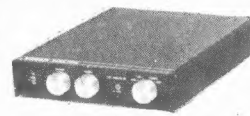
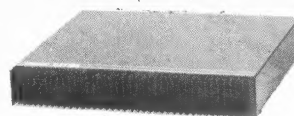
POWER SUPPLIES

We produce suitable power supplies which use our superb TOROIDAL transformers only 50mm high with a 120-240 primary and single bolt fixing (includes capacitors/bridge rectifier).

PRE-AMPLIFIER KIT THIS INCLUDES ALL METAL WORK, POTS, KNOBS, ETC. TO MAKE A COMPLETE PRE-AMP WITH CPR 1'S MODULE AND THE MC1-2'S IS REQUIRED

POWER AMPLIFIER KIT

The kit includes all metalwork, heatinks and hardware to house any two of our power amp modules plus a power supply. It is contemporarily styled and its quality is consistent with that of our other products. Comprehensive instructions and full back-up service enables a novice to build it with confidence in a few hours.



POWER AMPLIFIER MODULES

CE 608 60W/8 ohms 35-0.35v £19.52
CE 1004 100W/4 ohms 35-0.35v £23.02
CE 1008 100W/8 ohms 45-0.45v £25.86
CE 1704 170W/4 ohms 45-0.45v £31.00
CE 1708 170W/8 ohms 60-0.60v £33.87

TOROIDAL POWER SUPPLIES

CP51 for 2xCE 608 or 1xCE 1004 £16.58
CP52 for 2xCE 1004 or 2x4xCE 608 £18.80
CP53 for 2xCE 1008 or 1xCE 1704 £19.75
CP54 for 1xCE 1008 £17.12
CP55 for 1xCE 1708 £26.15
CP56mk 2xCE 1704 or 2xCE 1708 £25.53

HEATSINKS

Light duty, 50mm, 2 C/W £1.44
Medium power, 100mm, 1-4 C/W £2.35
Daco/group, 150mm, 1-1 C/W £3.04
Fan, 80mm, stage 120 or 240v £18.70
Fan mounted on two drilled 100mm heatinks 2x4 C/W, 65 max with two 170W modules £31.05

THERMAL CUT-OFF, 70°C

£1.54

Distributors:
Minc. Telprodrukter
Box 12035
S-750 12
Uppsala 12
Sweden

POWER AMP KIT

£35.03

PRE-AMPS

These are available in two versions — one uses standard components, and the other (the S), uses MO resistors where necessary and tantalum capacitors.

CPR1 £31.85
CPRIS £40.87
MC1 £21.28
MC1S £33.17
Pre-amp Kit £38.07

ACTIVE CROSSOVERS

XO2 £15.18
XO3 £23.58

POWER SUPPLY

REG1 £6.90 TR6 £1.97

BRIDGE DRIVER, BD1

Obtain up to 340W using 2x170W amps and this module

BD1 £5.76

CRIMSON ELEKTRIK

1A STAMFORD STREET, LEICESTER LE1 6NL. Tel. (0533) 553508
U.K. — please allow up to 21 days for delivery

Badger Sound Services Ltd., 46 Wood Street, Lytham St. Annes, Lancashire FY8 1QG

All prices shown are UK only and include VAT and post. COD 90p extra. £100 limit. Export is no problem, please write for specific quote. Send large SAE or 3 International Reply Coupons for detailed information.